

Piroplasmosis in the masked booby *Sula dactylatra melanops* in the Amirantes, Indian Ocean

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The few studies on the haematozoa of birds from islands in the Indian Ocean have been largely concerned with land birds (Bennett & Blancou 1974, Peirce & Cheke 1977, Peirce *et al.* 1977), although Lowery (1971) also examined some sea birds (*Fregata minor*, *F. ariel*, *Anous stolidus*) on Aldabra.

During a visit to some of the Seychelles, Amirantes and Farquhar islands in Oct.-Nov. 1976 C. J. F. collected blood samples and ticks from seabird colonies for further studies on arboviruses (Converse *et al.* 1975, 1976, Hoogstraal *et al.* 1976) which had been implicated in the desertion of eggs and chicks by Sooty Terns *Sterna fuscata* (Feare 1976). Whenever practicable, their blood smears were also collected, using techniques described by Peirce *et al.* (1977), for parasitological examination. The Sooty Tern breeding season was over, but in Masked Booby *Sula dactylatra melanops* colonies all stages of the breeding cycle were present.

Only 2 out of 34 birds examined (Table 1) were found to harbour haematozoa. Both were nestling Masked Boobies from Desnoeufs, Amirantes, and they showed very low parasitaemias with an hitherto unrecorded avian piroplasm. The morphology of the intra-erythrocytic parasites was typical of *Babesia* spp., which are tick borne, and they exhibited 'Maltese-cross' dividing forms which appear to be characteristic of species from avian hosts (Peirce 1975). Unfortunately, an insufficient number of parasites was present to permit a detailed description of what is almost certainly a new species; no such parasite has been previously reported from seabirds (Peirce 1975).

Two species of tick are found in Indian Ocean seabird colonies, the argasid *Ornithodoros capensis* and the ixodid *Amblyomma loculosum*. Argasid ticks are rarely incriminated as piroplasm vectors, so the more likely vector of this tick-transmitted parasite is *A. loculosum*. The discovery of these parasites in booby chicks suggests that transmission from tick to avian host occurs at the nest during the breeding season. *A. loculosum* is reported to be a rapid feeder, taking only a few days to complete engorgement (H. Hoogstraal pers. comm.) and it is therefore unlikely that many ticks are carried by the birds when they disperse from breeding colonies.

As transmission of *Babesia* spp. is usually via the transovarial route from infected female ticks and then by trans-stadial passage through larvae and nymphs to adults, there is probably a permanent reservoir of infected *A. loculosum* in and around nesting colonies. However, only 6 specimens of *A. loculosum* have been recorded from Desnoeufs, all of them in June (Hoogstraal *et al.* 1976). None was found in October 1976 when the blood smears were taken; nor were any found in the large (c. 3000 pairs) Masked Booby colony on Bordeuse. This apparently low density of *A. loculosum* is comparable with that on Bird Island, Seychelles, but contrasts with the heavy infestations recorded on African Banks, Amirantes, in June 1974 (Hoogstraal *et al.* 1976) and on Goelette Island, Farquhar Atoll (Stoddart & Poore 1970 Feare pers. obs. in October 1976). No blood smears have been taken from

seabirds on African Banks, but on Goelette Island no piroplasms were found in the blood of fledged but weak Sooty Tern chicks (Table 1), despite their high infestation with larvae, nymphs and adults of *A. loculosum*.

TABLE 1
Western Indian Ocean seabirds examined for blood parasites

| Bird species | No. examined /No. infected | | Location and date |
|----------------------------------------------|-------------------------------|------|-----------------------------------------------------------------|
| Brown Noddy <i>Anous stolidus pileatus</i> | Adult | 1/0 | Bird Island. 55° 12' E, 3° 53' S. 7.x.76. |
| Sooty Tern <i>Sterna fuscata nubilosa</i> | Chicks | 3/0 | Bird Island. 55° 12' E, 3° 53' S. 7.x.76. |
| Sooty Tern <i>Sterna fuscata nubilosa</i> | Chicks | 4/0 | Goelette Island, Farquhar Atoll. 51° 08' E, 10° 13' S. 24.x.76. |
| Sooty Tern <i>Sterna fuscata nubilosa</i> | Chicks | 17/0 | Desnoeufs. 53° 1' E, 6° 13' S. 15/16.x.76. |
| Masked Booby <i>Sula dactylatra melanops</i> | Chicks | 9/2 | Desnoeufs. 53° 1' E, 6° 13' S. 15/16.x.76. |

The absence of other haematozoa from the blood smears collected is inconclusive owing to the small sample of birds examined, but it is notable that Lowery (1971) found that on Aldabra 7% of seabirds examined were infected with haemoproteids.

The foregoing observations point to a need for further work on the piroplasms and tick vectors and their seasonal dynamics in relation to the varied avian reproductive cycles and tick abundances found in the different seabird colonies.

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An oviduct egg of the Indian Cuckoo *Cuculus micropterus*

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Medway & Wells (1976) give 2 breeding records for *Cuculus micropterus* in the Malay Peninsula, both involving juvenile specimens, taken in July and September respectively. They could find no records of eggs or nestlings and state that the hosts of this cuckoo are unknown in Malaya.

On 29 April 1964 I shot a ♀ of the resident race *C. m. concretus* as it flew over a path in primary forest at canopy height just before dusk, north of Kota Tinggi in the state of Johore (c. 1° 50' N, 103° 55' E), altitude under 150 m a.s.l. The oviduct contained a fully formed and pigmented egg, unfortunately broken by the shot. However, I noted that the shape appeared to be blunt on the broad pole and the colour of the yolk (surprisingly for a cuckoo) I recorded as 'deep orange'. The colour of the egg is very pale pinkish-grey, over which small spots of dark liver-brown (largest spots about 1 mm) are scattered rather regularly. Underlying these are less numerous and smaller spots of grey, all somewhat more concentrated around the broadest part of the egg. The egg has been repaired and now measures approximately 20 × 15 mm, certainly substantially less than its original size. It is not unlike some eggs laid by *Dicrurus* species.

The female has wing length 165 mm, tail 144 mm and anterior margin of nostril to bill tip 17 mm. It may not be in definitive adult plumage as the breast is rufous-buff and barred dark brown, and the tail is in irregular moult, the left and right outer rectrices being respectively 45 and 34 mm shorter than the central pair. The third and fourth right rectrices are 6 mm shorter than the second. Rufous notches are present on the webs of the central rectrices, evidently also indicating subadult plumage (Medway & Wells). The iris is brown, the gape, eyelids and feet yellow, as also is the hind claw, the other claws being horn-brown. The upper mandible and the cutting edge of the lower mandible are horn, the remainder of the bill grey. The stomach was packed with green and other caterpillars.

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